

by D. P. Todd.—On the occurrence of uranophane in Georgia, by T. L. Watson.—The internal structure of clintonite, by J. M. Davison. The view of Fletcher that this form of crystallised carbon is a pseudomorph after pyrite is not confirmed by these experiments.

Journal of Botany.—The June number opens with notes on Mycetozoa by Mr. Arthur Lister, F.R.S., and Miss G. Lister. Two species are figured and described; of these *Physarum gyrosum* is allied to *Fuligo septica*, while the other, *Chondrioderma asteroides*, is a new species which was found on pine needles and acacia leaves at La Mortola. In addition, the nomenclature of certain Mycetozoa collected by Dr. Celakovsky in Bohemia is discussed and revised. To the lists of Sussex plants already published by Mr. E. S. Salmon and Mr. Whitwell during the past half year is added another referring mainly to the west Arun district of west Sussex, contributed by Rev. E. S. Marshall. The catalogue of British marine algae compiled by Mr. Batters which began in the March number has now reached the genus *Ectocarpus*.

SOCIETIES AND ACADEMIES.

LONDON.

Royal Society, May 15.—“On Microscopic Effects of Stress on Platinum.” By Thomas Andrews, F.R.S., F.C.S., and Charles Reginald Andrews.

The microscopic effects of stress on platinum do not appear



FIG. 1.—Magnification 120 diameters.

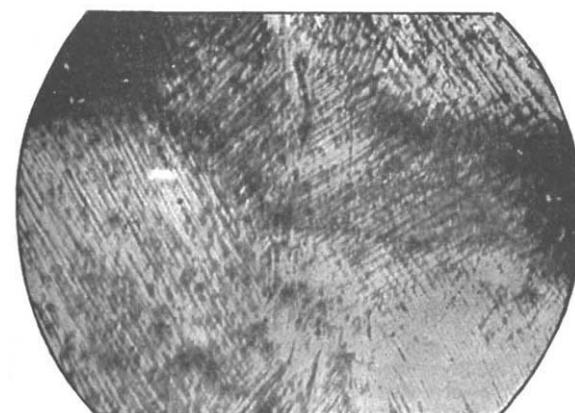


FIG. 2.—Magnification 250 diameters.
Microscopic effects of compressive stress on platinum showing crystalline slip as seen in section.
Arrow indicates direction of compressive force.

to have been studied. An ingot of pure platinum was therefore prepared, and from this a portion was accurately machined in the form of a cube, 0.30 inch square, which was afterwards

carefully microscopically polished and then subjected to compressive stress in the testing machine.

Prior to the application of stress, and for comparative purposes, a polished face of the platinum cube was microscopically examined, but an even polished surface only was observed. A force producing a compression of 10 per cent. on the total height of the cube was then applied, and microscopic observations were taken at high magnifications of the effects of the stress on the microcrystalline structure of the platinum cube.

The polished side of the cube upon which the high-power microscopic examination was made was the one in line, or in parallel, with the direction of the compressive force.

Owing to the varied orientation of the different crystals in the mass of the platinum, the lines of cleavage as indicated by the minute “slip bands,” were often seen at varied angles to the line of the straining force.

The general appearance of the disintegration of the large or primary crystal grains, produced by the pressure, on the pure platinum cube, was the apparent breaking up of the crystalline structure of the metallic mass, as seen in section, roughly diagonally to the line of the compressive force. The area enclosed by the main lines of disruption roughly approximating to the size of the large primary crystal grains.

The distances between the extremely fine lines, or “slip bands,” appeared roughly to coincide proportionately with the size of the secondary or most minute crystals forming the mass, the finer “slip bands” appearing to indicate the crystalline slip which had taken place along the facets of the smaller or secondary crystals. The direction, however, of the main lines of the crystalline disruption did not appear always to coincide with the intercrystalline facet junctions of the large or primary crystal grains. The lines of least resistance, or greatest crystalline slip, seemed chiefly to develop at an approximate angle of about 45 degrees to the pressure line, as previously mentioned; but the line of greatest weakness in the mass structure of the metal was not always at that angle with the line of the disruptive force.

The authors hope that these experiments may prove of use in affording an indication of the comparative behaviour of the noblest metal platinum, with the behaviour of the constructive metals, copper, nickel, iron and steel, when under the influence of stress; and the experiments have also shown that the microscopic influences of stress in the heavy metal platinum are analogous to those which have been observed in metals of lower specific gravity.

June 5.—“Contributions to the Study of Flicker.” Paper ii. By T. C. Porter, M.A., Eton. Communicated by Lord Rayleigh, F.R.S.

This paper is the sequel to that already published in the *Proceedings*, vol. Ixiii. It first details various precautions which experiments, carried out since that paper, have shown to be necessary in estimating the rate at which a black disc with a white sector must be rotated in order that the sensation of flicker may just vanish. Results are given which prove that the central portion of the retina is less sensitive to flicker than its outer region. The effect on the flicker of the measured want of blackness in the black sector is also discussed. The most important results of a long series of experiments, in which many observers took part (in order to eliminate as far as possible the personal equation), is to prove that, if n be the number of rotations per second of the disc when flicker just vanishes, the angular magnitude of the white sector being kept constant, but the illumination of the disc being varied, by altering its distance from a measured and constant illuminant, then $n = a + b \log I$, where a is a constant, and b is also a constant for all illuminations between a very feeble one and one under which the disc becomes almost unbearably bright. A full description of the illuminants used and of the measurement of the illuminations caused by them on the disc is given in the paper. At very low illuminations it is proved that the value of b changes with unexpected rapidity, apparently becoming again constant. The bearing of the above equation on the practical value of the flicker photometer, and also the number of kinematograph photographs which must be projected on a screen per second in order to get rid of flicker, is stated.

The second important result is the experimental determination of n , when the illumination of the disc is kept constant, but its apparent brightness is altered by altering the angular magnitude of the white sector. If this last, measured in degrees, is called w , the magnitude of the black sector will be $360 - w$, and if

c and *d* are constants, then the relation connecting these quantities with *n* is $n = c + d \log w (360 - w)$. If the distance of the disc from the illuminant is now varied, so that *I* varies, the equation connecting all these quantities with *n* (the number of rotations of the disc per second when flicker just vanishes) is $n = k + k' \log I. \log w (360 - w)$, where *k* and *k'* are constants (though it must be remembered that *k'* has a different value for very feeble illuminations). All these results are clearly exhibited in the paper by numerous interesting curves. It is also shown that the different curves obtained by placing the disc in the different colours of the same spectrum, and varying the angle of the white sector by steps of 10° from 0° to 180° in each colour, can all be obtained by viewing the disc illuminated by white light and simply varying the intensity of the illumination, which proves that *n* is unaffected by the wave frequency of the different colours and is solely influenced by their intensity.

Finally a curve, showing the relative intensity of the light of different parts of the same spectrum, deduced from the results of the present paper, is given, and proves to be actually coincident, within the errors of experiment (except for the very faint illuminations at the two ends of the visible spectrum) with the curve expressing the same thing given by Vierordt, but obtained by him, as by Abney and others, in an altogether different way.

"The Spectra of Potassium, Rubidium and Cæsium, and their Mutual Relations." By Hugh Ramage, B.A., St. John's College, Cambridge. Communicated by Prof. G. D. Liveing, F.R.S.

Tables of the oxyhydrogen flame spectra of the above three metals are given, which contain a number of lines not hitherto recorded. The lines which form the second subordinate series of caesium and several members of the corresponding series of rubidium are new; so also are some of the lines of the first subordinate and the principal series of both metals. The flame spectra were photographed with a spectrometer fitted with a Rowland plane grating; spark spectra of iron, titanium, &c., were superimposed on the flame spectra to furnish fiducial lines. Some of the lines in the red region of the spectrum were measured by eye observations.

Diagrams of the subordinate series in the spectra were drawn to scales of oscillation frequencies for abscissæ and (1) atomic masses, (2) squares of atomic masses for ordinates. The conclusions deduced in the author's previous paper (*Proc. Roy. Soc. Proc.*, vol. lxx, p. 1, 1902) from less complete data were amply confirmed. There is undoubtedly a very close connection between these series and the atomic masses, and the lines which connect the corresponding members of homologous doublets in diagram (2) do intersect on the ordinate of zero atomic mass. The points which bisect the limits towards which the subordinate series converge in each spectrum lie on straight lines in diagram (1). The constants in Rydberg's general formula were then expressed in terms of the atomic masses; the oscillation frequencies of the lines, calculated from the modified formula, are given in the paper, together with the observed numbers. The convergence points of the series were calculated by different methods and the results are given. It would appear from these that the two subordinate series do not converge towards the same limits.

All the strong lines and nearly all the weak lines which have been observed in the flame and arc spectra of these three metals are included in the three harmonic series. The differences between the corresponding series in the spectra appear to depend on the atomic masses alone. Reasons are also given for thinking that the principal and the second subordinate series are more closely related to each other than to the first subordinate series.

Chemical Society, June 5.—Dr. Thorpe, C.B., F.R.S., in the chair.—The action of ungerminated barley diastase on starch, part i., by Dr. J. L. Baker. The hydrolytic products of this action are a new amyloextrin and maltose. The former is slowly converted by the further action of the enzyme into maltose and a small proportion of dextrose. The decomposition of chlorates, part v., potassium chlorates in presence of oxides of manganese and the theory of perchlorate formation, by Mr. W. H. Sodeau. It is shown that, since the amount of chlorine produced by heating potassium chlorate in presence of manganese dioxide is not increased by reduction of pressure, no secondary reaction can occur, and therefore McLeod's theory of permanganate formation is untenable.—Studies in the tetrahydronaphthalene series, i., the diazo-amino-compounds of *ar*-tetrahydro- β -naphthalene,

by Mr. C. Smith.—Experiments on phosphorus tetroxide, by Mr. C. A. West. When phosphorous oxide, P_4O_6 , is heated at 300° , it decomposes into phosphorus tetroxide and free phosphorus. The former is an extremely stable substance, volatilising only with difficulty at 1400° . Its composition is represented by the formula P_8O_{16} . The decomposition of compounds of selenium and tellurium by moulds and its influence on the biological test for arsenic, by Dr. Rosenheim. Certain moulds, such as *Aspergillus*, *Mucor* and *Penicillium*, decompose tellurium and selenium compounds with the production of a faecal odour which masks the garlic odour given off by these moulds when grown in arsenical solutions.—Constituents of gambier and acacia catechu, by Messrs. A. G. Perkin and E. Yoshitake. The authors have isolated from these sources three closely related substances, distinguished as catechins *a*, *b* and *c*.—The decomposition of oxalacetic hydrazone in aqueous and acid solutions, and a new method of determining the concentration of hydrogen ions in solution, by Messrs. H. O. Jones and O. W. Richardson. When the hydrazone is heated in aqueous solution it decomposes into pyruvic hydrazone and pyrazolone carboxylic acid, the production rate of the former being proportional to the concentration of the original hydrazone, and of the latter to the concentration both of the hydrazone and the hydrogen ions.—The dissociation constants of oxalacetic acid and its hydrazone, by Messrs. H. O. Jones and O. W. Richardson.—Derivatives of butyrylpyruvic acid, by Dr. A. Lapworth and Mr. A. C. O. Hann.—Sulphocampholene carboxylic acid, by Mr. A. W. Harvey and Dr. Lapworth.—Some properties of camphorquinonephenylhydrazone, by Dr. A. Lapworth and Mr. A. C. O. Hann. The authors have been unable to obtain the "keto" form of this substance in a pure state, but have obtained evidence of its existence and have studied the rate at which equilibrium between the "keto" and "enol" forms is attained under various conditions.—Optically active esters of β -ketonic and β -aldehydic acids, part i., methyl hydroxymethylenephenoxyacetate, by Dr. Lapworth and Mr. A. C. O. Hann. The authors propose to investigate these esters in the hope of obtaining an insight into the peculiar tautomeric relations of the acids from which they are derived.—Part ii., methyl acetoacetate, by Dr. Lapworth and Mr. A. C. O. Hann.—The mechanism of simple desmotropic change, by Dr. Lapworth and Mr. A. C. O. Hann. An extension of Brühl's views on the mechanism of tautomeric change.—Trimethylbrazilone, by Dr. W. H. Perkin, jun. An investigation is being made into the constitution of this substance, which is obtained by the oxidation of brazilin.

Entomological Society, June 4.—The Rev. Canon Fowler, president, in the chair.—Mr. H. W. Sheppard-Walwyn exhibited a male specimen of *Lampides baeticus* taken recently emerged at Winchester in September, 1899, and two varieties of *Lycaena icarus*.—Mr. C. T. Pickett exhibited one asymmetrical male and two females of *Dilina tiliae*, and a series of the same insect showing great variation in colouring and markings, bred during May, 1902.—Mr. F. Merrifield exhibited photographs showing the protective resemblances of the larva and pupa of *Hygrochroa syringaria*.—Prof. E. B. Poulton exhibited a lantern slide showing the perfect protective resemblance of *Hybneria leucophæaria* to the oak trunk upon which it rested.—Mr. A. Bacot exhibited hybrid larva resulting from a pairing between a male *Malacosoma neustria* and a female *M. castrensis*, also larvae of *M. neustria* and reputed larvae of *M. francoonica* for comparison.—Mr. H. C. Elwes read a paper on the butterflies of Chile, illustrated with many specimens taken during an expedition last winter to that country. The poverty of the Chilian rhopalocerous fauna is notable. Of the insects represented there was probably only one really Chilian Colias, the most numerous family being the Satyridæ, of which some twenty-five species were taken. The Nymphalidæ are few in number, while three native Theclids and three Lycaenids represent their respective groups. Mr. Elwes drew especial attention to one unique species, *Argyrophorus argenteus*, which flies at 3000 to 7000 feet, the upper-side of all the wings in male and female being unicolorous and brilliant metallic silver, the under-side resembling somewhat that of the Holarctic family Eneis. A similarly beautiful golden sheen was observable on *Cyclopides puelmae*, a species of Hesperiid, but on the ground of protective coloration there seemed nothing in the surroundings of either insect to account for the peculiarity. Between alpine and lowland species there was no distinction,

although the season on the coast would be over when that upon the high mountains commenced.—Mr. S. L. Hinde read a paper, illustrated by lantern slides, upon the protective resemblance to flowers borne by an African Homopterous insect, *Flata nigrocincta*, Walker. He said that "the cluster of insects grouped to resemble a flower spike," which forms the frontispiece of Prof. J. W. Gregory's "Great Rift Valley," had attracted some criticism, and that as he was familiar with the insect figured, and with its larva, in a wild state, it seemed desirable to publish the evidence. In the plate the insects are collected on the vertical stem, the green individuals uppermost considerably smaller than the red ones beneath, like the unopened green buds towards the top of a flowering spike as compared with the expanded blossoms below. The separate representations of the green and red forms, however, indicate no difference in size, and experience confirms this conclusion, so that the impression conveyed by the frontispiece plate is erroneous. After further noting that the uniform deep pink colour of the exposed parts of the insects figured was also incorrect, Mr. Hinde remarked that he had never seen the insects grouped according to their colours, but invariably mixed, that he had never found larvae and imagines on the same stem or even together on the same tree or bush, nor did the imagines affect vertical stems, but always those actually or approximately horizontal. Sir George Hampson said the insects figured were orange when brought home, and the pink-winged imago was an error of the colorist.

Mineralogical Society, June 10.—Dr. Hugo Müller, president, in the chair.—Dr. A. Hutchinson gave an account of the experiments he had made in order to discover the cause of the discrepancy in the results obtained by Meigen and Panebianco in the application of Meigen's method of discriminating calcite and aragonite. He found that calcite, when treated with a boiling dilute solution of cobalt nitrate, only remains white or becomes yellow (as stated by Meigen) when the cobalt nitrate contains traces of iron, and that Panebianco's lavender-blue colour is only obtained when the cobalt nitrate is free from iron.—Mr. G. F. Herbert Smith discussed some crystals of krennerite from Nagyag on which he found a large number of forms not previously recorded. He further exhibited the new three-circle goniometer recently constructed from his designs by Messrs. Troughton and Simms for the British Museum. He pointed out the advantages of the gnomonic projection in crystallography, and showed a table which he had prepared to facilitate the employment of this method of projection.—Mr. G. T. Prior exhibited specimens and described the mineral constituents of the volcanic dust which fell in Barbados on May 7 and 8 after the eruption of the Soufrière of St. Vincent. The fact that the constituents are like those of a hypersthene-augite-andesite connects the eruptions with the Pacific rather than with the Atlantic volcanic chain.—Mr. L. J. Spencer pointed out reasons for the non-existence of "kalgoorlite" and "coolgardite" as mineral species. At Kalgoorlie, in Western Australia, with the tellurides of gold and silver, sylvanite $(\text{Au}, \text{Ag})\text{Te}_3$, calaverite $(\text{Au}, \text{Ag})\text{Te}_3$, and petzite $(\text{Ag}, \text{Au})_2\text{Te}$, is frequently associated the telluride of mercury, coloradoite. The iron-black petzite and coloradoite are identical in external appearance, and sometimes occur intimately associated together. In such cases minute fragments detached from an apparently homogeneous mass are found on blow-pipe analysis to be sometimes coloradoite and sometimes petzite. Analysis of larger pieces would therefore show the presence of tellurium, gold, silver and mercury in variable proportions, as is actually the case in the analysis of "kalgoorlite" and "coolgardite," described as new mineral species by Pittman in 1897 and by Carnot in 1901 respectively. Neither of these investigators appears to have been aware of the occurrence of coloradoite at Kalgoorlie, and the materials they analysed were without doubt mechanical mixtures of coloradoite and the above-mentioned tellurides of gold and silver, especially petzite.—Mr. R. H. Solly described the crystallographic characters of liveingite, a new sulph-arsenite of lead $(5\text{PbS}_4\text{As}_2\text{S}_3)$ from the Binnenthal, a preliminary account of which was given by him in the *Proc. Cambridge Phil. Soc.*, 1901, xi. p. 239. Measurements of three good crystals more recently obtained, showed that the system was orthorhombic, and that $100, 110 = 44^\circ 49'$; $010, 011 = 46^\circ 48'$; $001, 101 = 43^\circ 23'$. In the prism zone the faces (210) , (430) , (540) , and in the macrodome zone the faces (302) , (504) , (908) , (101) are well developed, and (100)

is a cleavage plane. A pyramid zone with numerous small faces is also present. The crystals often exhibit a polysynthetic growth parallel to (100) . In appearance they resemble ratite.

Mathematical Society, June 12.—Dr. E. W. Hobson, president, in the chair.—The president announced that the council had awarded the De Morgan medal, 1902, to Prof. A. G. Greenhill.—Prof. Love communicated a paper by Prof. Conway on Huygens' principle in a uniaxial crystal. It is shown that, when electric waves are propagated in a crystalline medium with an axis of symmetry, the radiation is resolvable into constituents (1) with electric force at right angles to the axis, (2) with magnetic force at right angles to the axis, (3) with both forces at right angles to the axis. The types of radiation that are due to electric and magnetic doublets with their axes parallel and perpendicular to the axis of symmetry are determined, and it is shown that the radiation received at any point can be regarded as made up of secondary waves due to such doublets distributed upon an arbitrary surface separating the point from the actual sources of the radiation.—Lieut.-Colonel Cunningham gave an account of some investigations on repetition of the sum-factor operation. The result of the repetition of the operation upon a number is very frequently unity when the operation is repeated sufficiently often; in the case of one small class of numbers the result is a perfect number; in another small class, a pair of amicable numbers; in a third small class, the result may increase beyond the power of practical calculation.—The following papers were communicated from the chair:—M. E. Picard, *Sur un théorème fondamental dans la théorie des équations différentielles*. This note deals with the question of the possibility of the existence of a non-holomorphic integral, which, besides satisfying a given ordinary differential equation, also satisfies a special condition at a certain point.—Mr. G. H. Hardy, some arithmetical theorems. Cauchy's theory of residues is used to obtain various relations between sums of terms of the form $\left(\left(\frac{\sigma b}{a}\right)\right)$, in which a and b are fixed integers, and σ is an integer which ranges over a certain set of values, the summation is taken with respect to σ , and $((x))$ denotes the algebraic difference between x and the absolutely nearest integer.—Prof. M. J. M. Hill, on a geometrical proposition connected with the continuation of power series. A power series with a circle of convergence C_1 having been derived from a given power series with a circle of convergence C_0 , it is possible to choose successive positions of a point x , so that every point of the region that is common to C_0 and C_1 shall be within one at least of the circles described with x as centre to touch C_0 and C_1 internally.—Mr. J. H. Grace, on types of perpetuants. The numbers of perpetuants of one or more forms have been determined by Stroh and MacMahon, and the latter has accounted for each perpetuant by a corresponding umbral form. In the present paper the perpetuants of any number of forms are found by the direct reduction of Aronhold's symbolical forms.

Royal Meteorological Society, June 18.—Mr. R. Inwards, vice-president, in the chair.—Mr. F. C. Bayard read a paper on English climatology, 1891-1900, which is a discussion of the climatological data printed in the "Meteorological Record." In 1874, the Royal Meteorological Society commenced the organisation of a series of stations at which the observations are made twice a day on a uniform plan, so that the results may be strictly comparable with each other. In addition to these the Society in 1880 organised another class of stations, termed "climatological," at which the observations are made once a day, viz. at 9 a.m. Mr. Bayard on a former occasion worked up the results from these climatological stations for the ten years 1881-90, and in the present paper he gives the averages from sixty-nine stations for the ten years 1891-1900. The elements dealt with are temperature, relative humidity, amount of cloud, rainfall and rainy days, and the results are a valuable contribution to the climatology of the British Isles.—A paper by Mr. W. L. Dallas on earth temperature observations recorded in Upper India was also read, in which the author discussed the observations made on the temperature of the soil at three stations, viz. Lahore, the capital of the Punjab; Dehra Dun, in the north-west of the North-Western Provinces; and Jaipur, the capital of the native State of that name. The observations, which were made at depths varying from 4 inches to $4\frac{1}{2}$ feet below the surface, extended from 1884 to 1899.

PARIS.

Academy of Sciences, June 16.—M. Bouquet de la Grye in the chair.—On anomalous dispersion in correlation with the absorbing power of bodies for radiations of a determined period, by M. J. Boussinesq.—Arsenic as a normal constituent of animals, and its localisation especially in their ectodermic organs, by M. Armand Gautier. Remarks on a note of M. Gabriel Bertrand, and replies to the criticisms of Hödlmoser, Cerny and Ziemke. The author points out that his positive results for certain parts of the body were always accompanied by parallel experiments with the same reagents upon other portions of the body in which negative results were obtained. The fact that under proper conditions arsenic is only normally found in the skin, nails, thymus and thyroid gland is of the highest importance in toxicological researches. Stress is laid upon the attention to detail necessary to secure trustworthy results.—Dissociation of the elements of the energy expenditure of motors employed in overcoming frictional resistances, by M. A. Chauveau.—On the mode of multiplication of Trypanosomes in fishes, by MM. A. Laveran and F. Mesnil. *Trypanosoma Remaki* and *Trypanoplasma Borrelia* both multiply by binary division similarly to *Tr. Brucei* previously described. A fish carrying these parasites can easily inoculate another of the same species. The parasites do not appear to have any pathogenic action on the fish.—On a hypothesis concerning the origin of satellites, by M. L. Picart. A consideration of the question as to the possibility of small planets or comets being converted into satellites of a larger planet. None of the satellites of the known planets correspond to the conditions necessary for this view.—On certain couples of applicable surfaces, by M. Maurice Fouché.—On the integration of differential systems which are completely integrable, by M. E. Cartan.—On the displacement and disturbance of equilibrium, by M. Jouguet.—The electric discharge in flame, by M. Jules Semenov.—On the electrostatic effects of a magnetic variation, by M. V. Crémieu. In reply to the criticisms of M. Carvallo, the author describes the latest form of apparatus used by him. Although, according to the Maxwell theory, the effects produced should have been quite appreciable, the results have been uniformly negative. The conclusions arrived at in the earlier work of the author on the non-existence of electric forces created in dielectrics by magnetic variations are completely confirmed by the later work.—On a magnetic disturbance observed at Athens on May 8, by M. D. Eginitis. The magnetic disturbance coincided with the eruption of Mont Pelée. From the fact that the seismograph showed absolutely no disturbance, and that a similar phenomenon was simultaneously observed at Paris, it is concluded that the disturbance must have been of a magnetic or electric nature.—The polymerisation and heat of formation of oxide of zinc, by M. de Forcand. On ignition, zinc oxide undergoes a change into a polymeric modification with the evolution of heat.—Combinations of hydrogen sulphide with anhydrous aluminium chloride, by M. E. Baud. By the action of liquid sulphuretted hydrogen upon anhydrous chloride of aluminium, two compounds are formed, one, $Al_2Cl_6 \cdot H_2S$, stable at the ordinary temperature, the other, $Al_2Cl_6 \cdot 2H_2S$, dissociable at about $-45^\circ C$.—On the alloys of cadmium and magnesium, by M. O. Boudouard. Two definite alloys of these two metals have been isolated, $CdMg$ and $CdMg_4$. The study of the fusibility curves pointed to the existence of a third, $CdMg_{30}$, but this could not be definitely isolated.—On the existence of arsenic in the organism, by M. Gabriel Bertrand. The author has elaborated the method of M. Gautier for the determination of minute quantities of arsenic in organic material, and is able to detect with certainty as little as 1/1000th of a milligram. The results of M. Gautier are generally confirmed. A point of especial interest was the proof of arsenic in the thyroid glands of *Phoca barbata*, captured near Spitzbergen, a case to which the theory of industrial contamination could not possibly be applied.—On isomerism in the benzylidene-methones and on the preparation of an α -methyl- α -isopropyladipic acid identical with dihydrocamphoric acid, by M. G. Martine. The identity of the acid obtained by the oxidation of benzylidene-menthone with potassium permanganate with the dihydrocamphoric acid of Crossley and Perkin has been completely proved.—Pyromucic and isopyromucic acids. The action of phosphoryl chloride and phosphorus pentachloride, by M. G. Chavanne. Isopyromucic

acid differs from the isomeric pyromucic acid in not being a true acid, and is apparently a phenol.—On a new glucoside, aucubine, extracted from the seeds of *Aucuba japonica*, by MM. Em. Bourquelot and H. Hérissey. The new glucoside occurs in the seeds mixed with a large quantity of cane sugar, from which it can be separated by fermentation of the sugar by yeast. Dextrose is one of the products of hydrolysis of the glucoside.—On the production of glycose by the muscles, by MM. Cadéac and Maignon. The muscles resemble the liver in producing sugar after death, the amount produced being a function of the temperature to which the muscle is exposed. This action is in no way connected with putrefaction.—On the haemolytic action of cobra poison, by M. A. Calmette.—Permanent contraction in the pigeon, by M. Louis Boutan.—On the aerobic fermentation of manure, by M. C. Dupont. The aerobic fermentation of farm manure is due to two bacteria, *Bacillus mesentericus ruber* and *Bacillus thermophilus Grignoni*; these bacteria burn the nitrogenous materials, sugars, starches and gums.—On the internal morphology of the genus *Thylacolethrus*, a parasite of the Alpheidae, by M. H. Coutière.—On the impressions produced under the influence of certain gases, by M. A. J. J. Vandeveld. The author has produced images similar to those described by MM. Vignon and Colson, making use for this purpose of hydrogen sulphide, ammonia, hydrochloric acid and iodine.—On the subterranean river of Trépail, Marne, by M. E. A. Martel.—Physiological photometry, by M. G. M. Stanoievitch.—A new method of measuring muscular sensibility, by MM. Toulouse and Vaschide.—On a vertical series of densities of sea water of the Mediterranean, by M. J. Thoulet.

CONTENTS.

PAGE

Biblical Criticism at its Best and Worst	193
The Foraminifera. By J. J. L.	196
Unorganised Ferments. By Dr. F. Mollwo Perkin	197
Our Book Shelf :—	
Wislicenus: "Astronomischer Jahresbericht." — Dr. W. J. S. Lockyer	198
Mackenzie: "Elements of Metaphysics." — A. E. T.	198
Zeuthen: "Histoire des Mathématiques dans l'Antiquité et le Moyen Age." — M.	199
" A la Conquête du Ciel! Contributions Astronomiques de F. C. de Nascus, en Quinze Livres"	199
Letters to the Editor :—	
Mr. Marconi's Results in Day and Night Wireless Telegraphy.—Prof. J. Joly, F.R.S.	199
Remarkable Sunsets at Madeira.—F. W. T. Krohn	199
The Institution of Electrical Engineers' Deputation on Electrical Legislation	199
Report on the Teaching of Geometry. By C. G.	201
Seismic Frequency in Japan. By Prof. J. Milne, F.R.S.	202
The West Indian Volcanic Eruptions	203
The Royal Society Soiree	204
Notes	205
Our Astronomical Column :—	
Astronomical Occurrences in July	208
The Anna Bredikhine Astronomical Prize	208
Occultation of W Leonis	208
A Remarkable Bolide Observed at Lyons on March 19	208
Notation of Variable Stars	208
Study of Bright Points and Curves. (Illustrated)	208
Variation — Germinal and Environmental. By F. A. D.	209
Rust-Fungus. (Illustrated)	210
University and Educational Intelligence	212
Scientific Serials	212
Societies and Academies. (Illustrated)	213